

# PATENT SPECIFICATION

343,368



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## COMPLETE SPECIFICATION.

### Improvements in and relating to Rotary Folding Apparatus for use in Rotary Web Printing Machines and the like.

We, JOSEPH FOSTER AND SONS LIMITED, a British Company, of Soho Foundry, Preston, Lancashire, and ROBERT BRADSHAW, a British Subject, of the same address, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

10 This invention relates to improvements in rotary folding apparatus for use in rotary web printing machines and the like.

15 The object of the invention is to provide improvements in impaling pins or needles for use on folding cylinders whereby the pins or needles are so arranged that they can be manipulated as a single unit, removed without disturbing the usual cam operating gear, rendered inoperative if desired without removal and are generally so arranged that they can be adjusted and the number of points changed by simple operations 25 from the outside of the cylinder.

Heretofore folding cylinders have been provided with a series of impaling pins or needles, each carried in a separate holder, each holder being mounted on a crank, or arm, the series of cranks or arms being mounted on an actuating rod arranged in a recess extending across the face of the cylinder. Further it has been proposed to operate the actuating rod by means of a crank arm engaging a suitable cam, and in such an arrangement it has been proposed to render the pins or needles inoperative by sliding the crank arm along the rod out of engagement with the cam.

40 In all such arrangements the pins can only be removed by disconnecting individual holders in some suitable manner.

According to the invention a needle bar is provided, arranged in a clearance 45 groove in the periphery of the folding cylinder and the desired series of needles is secured directly to the bar. For example each needle may be carried in a socket adapted to be tapped into a hole 50 in the bar. The bar preferably extends the full length of the cylinder. To enable the bar to project and retract the needles in the usual manner its ends are connected

to arms carried on a rock shaft in the cylinder. At one end the rock shaft carries a lever on which a cam bowl engaging an adjacent box or other cam is mounted, the lever also detachably engaging the adjacent end of the needle bar. The clearance groove is preferably covered by a plate which is arranged to leave a slot through which the points of the needles on the needle bar project. As the cylinder is rotated the cam action causes the needle points to be projected and retracted through the aforesaid slot in the usual manner.

The needle bar is so connected to the rock shaft that it can be pushed longitudinally into the cylinder, causing it to be disengaged from the cam bowl lever and thus held out of action as hereinafter described. The cylinder can now be rotated without operation of the needle bar.

By providing a large number of holes in the bar the number of needles used may be readily adjusted as will be readily understood.

With the above described construction the needle bar and the rock shaft operating same can readily be removed as a unit.

The cylinder may be provided with two or more needle bars and preferably one of the bars is so mounted that while it can readily be detached from outside the cylinder, it cannot be put out of operation as hereinafter described.

To enable the invention to be fully understood it will now be described by reference to the accompanying drawing in which:—

Fig. 1 is an end elevation of a folding cylinder of a high speed rotary newspaper folding machine having needle bar arrangements attached thereto according to one form of the invention, and

Fig. 2 is a side elevation thereof, with the cover of the needle bar groove removed.

Fig. 3 is a plan view and

Fig. 4 is an end elevation of a needle bar capable of being rendered inoperative according to the invention, and

Figs. 5 and 6 are views similar to Figs.

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3 and 4 respectively of a needle bar according to the invention which is always in operation when the cylinder is rotating.

5 As shewn in Fig. 1 the cylinder 7 is fitted with two needle bars 8, 9 mounted in clearance grooves 10, 11 respectively in the periphery of the cylinder. Each bar extends the full length of the cylinder and carries the needles 12. Each needle 10 is mounted in a holder 13 which is tapped into a hole formed in the bar. By providing the desired number of holes in the bar any number of needles may be 15 mounted. In the example illustrated the needle bar 8 is mounted in such a manner that it can be rendered inoperative, while the bar 9 is mounted in such a manner that it will operate as long as the cylinder 20 is rotated.

If desired both bars may be arranged to be rendered inoperative at will, or to be permanently in operation as will be understood.

25 The bar 8 is provided at its ends with slots 14, 15, the slot 14 being open at one end, and the bar is secured by screws 16, 17, passing through the slots to arms 18, 19 fixed on a rock shaft 20, carried in 30 capped bearings 21, in the periphery of the cylinder. Preferably the arm 18 is integral with the rock shaft while the arm 19 is keyed thereto. A lever 22, carrying a cam bowl 23 is loosely mounted 35 on one end of the rock shaft 20, the bowl engaging an adjacent box cam 24 while the top of the lever engages the slot 14 in the needle bar. The bar is also provided with a lug 25 and the cylinder with 40 a recess 26 adapted to receive the lug when the bar is in the inoperative position. The groove 10 is partially closed by a cover plate 27 which allows the needle points to project.

45 As the cylinder is rotated, with the parts in the position shewn, the needle points are projected and retracted in the usual manner by the cam action.

To render the needle bar inoperative, 50 it is necessary, simply to loosen the screws 16, 17, and to push the bar longitudinally into the cylinder until the slot 14 is disengaged from the lever 22 and the lug 25 is seated in the recess 26. The screws 55 are then tightened and if the cylinder is rotated, the needle bar remains out of action, the lever 22 rocking freely on the rock shaft 20.

The needle bar 9 (Figs. 5 and 6) is of 60 a somewhat similar construction to the bar 8 but is so mounted that it cannot be put out of action. In this case the ends of the bar are not slotted, but it is secured by screws 28 to arms 29, 30 on a 65 rock shaft 31. The arm 29 is preferably

integral with the rock shaft while the arm 30 is keyed thereon. A cam bowl lever 32 is secured to the rock shaft by a screw 32a to facilitate assembly or dismantling and engages the box cam 24. When the 70 cylinder is rotated the needle bar is operated as above described with reference to the bar 8. A cover plate 33 is provided over the groove 11.

It will be obvious that with the arrangements described above the needle bars and 75 pins may be readily adjusted from the exterior of the cylinder, and also the needle bars, pins, rock shaft, rocker arms, cam bowl lever and cam bowl can be removed without disturbing the cylinder or 80 cam.

While the drawings shew a cylinder fitted with two sets of pins or needles it 85 will be understood that the invention can be applied to a cylinder having any number of sets.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to 90 be performed, we declare that what we claim is:—

1. In a rotary folding cylinder the provision of a bar carrying a series of impaling pins or needles mounted directly 95 thereon and arranged in a clearance groove extending across the periphery of the cylinder, said bar being attached at its ends to an actuating rock shaft mounted in the cylinder. 100

2. In a rotary folding cylinder according to claim 1 an arrangement wherein the needles or pins are secured in holders or recesses provided in the bar.

3. In a rotary folding cylinder according to claim 1 or 2, an arrangement 105 wherein the bar is mounted on arms carried on a rock shaft mounted in the cylinder, one end of the shaft carrying a cam bowl lever, the bowl engaging a box 110 or other cam while the lever engages one end of the needle bar.

4. In a rotary folding cylinder according to claim 1, 2 or 3 an arrangement 115 wherein the needle bar is mounted so that it can be moved longitudinally in the clearance groove into or out of engagement with the cam bowl lever and secured in either position for the purposes 120 described.

5. In a rotary folding cylinder according to claim 4 an arrangement wherein the ends of the needle bar are slotted, the slot adjacent to the cam bowl lever being 125 open, the bar being secured to the rock shaft arms by screws passing through the slots, the cam bowl lever engaging the open ended slot when the bar is in the operative position.

6. In a rotary folding cylinder accord- 130

ing to claim 4 or 5 an arrangement wherein the needle bar is provided with a lug and the cylinder with a recess adapted to receive the lug when the bar is moved into the inoperative position.

7. In a rotary folding cylinder according to claim 1, an arrangement wherein the lever carrying the cam bowl is detachably secured to the rock shaft to enable the rock shaft, rock shaft arms, needle bar, and cam bowl lever to be readily withdrawn from the cylinder as a unit, substantially as described.

8. In a rotary folding cylinder according to any one of the preceding claims an arrangement wherein the cylinder is provided with two needle bars carried in clearance slots in the periphery of the cylinder, each adapted to be rocked by cam gear, one bar being adapted to be moved longitudinally out of engagement with the cam gear and secured in the inoperative position, while the other bar remains fixed in the operative position as long as the cylinder is rotated.

9. In a rotary folding cylinder according to any one of the preceding claims an

arrangement wherein the cylinder is provided with one or more needle bars carried in clearance slots in the periphery of the cylinder, each adapted to be rocked by cam gear, and so arranged that each or any one may be moved longitudinally out of engagement with the cam gear and secured in the inoperative position or may be fixed in the operative position.

10. For use in rotary folding cylinders for rotary web printing machines and the like, needle bars and operating gear constructed, arranged and operating substantially as hereinbefore described with reference to the accompanying drawing.

11. Rotary folding cylinders for rotary web printing machines and the like, having impaling pins or needles constructed, arranged and operating substantially as hereinbefore described with reference to the accompanying drawing.

Dated this 1st day of April, 1930.

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W.C. 2,  
Agents for the Applicants.

[This Drawing is a reproduction of the Original on a reduced scale.]

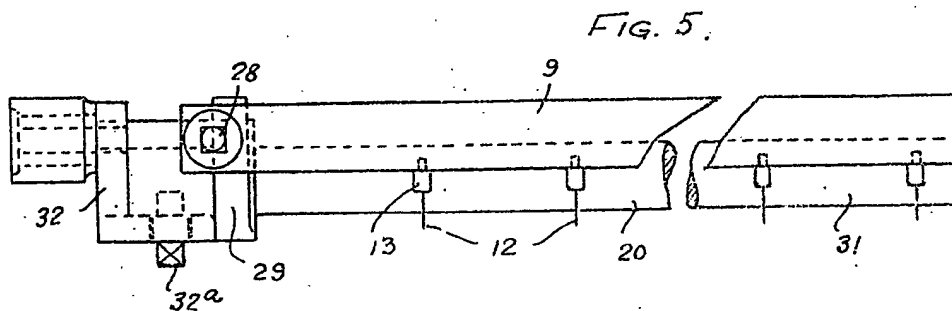
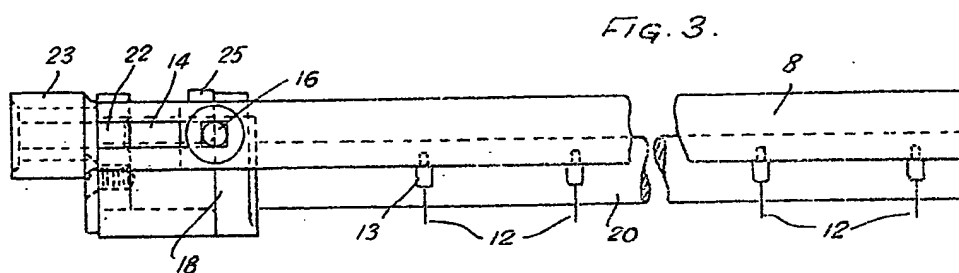
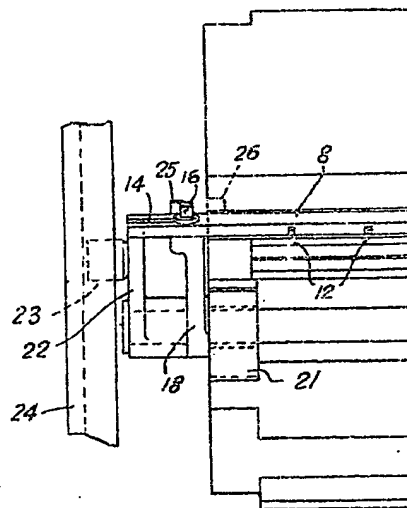
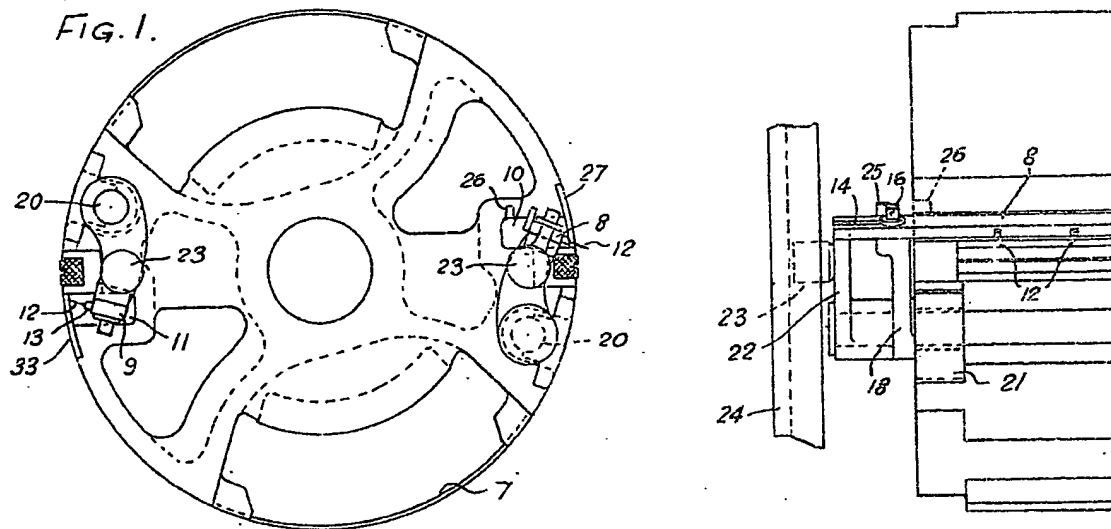
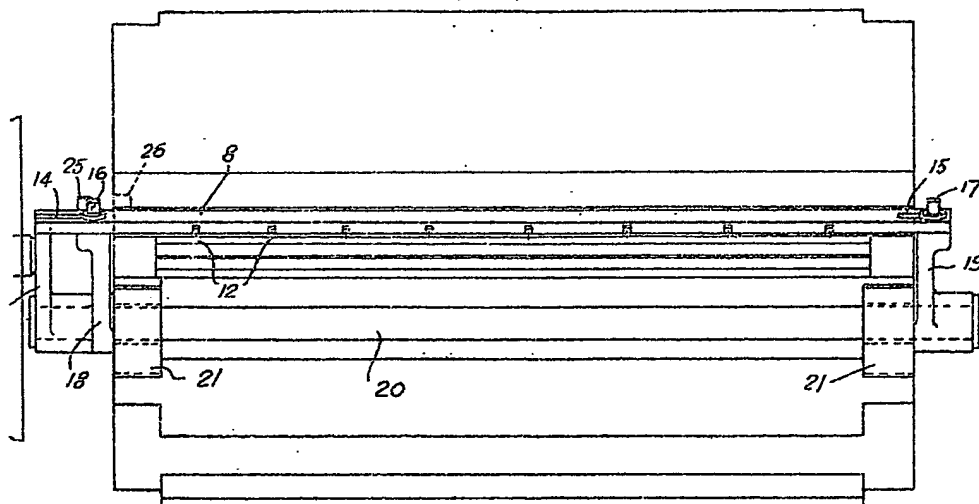


FIG. 2.



3.

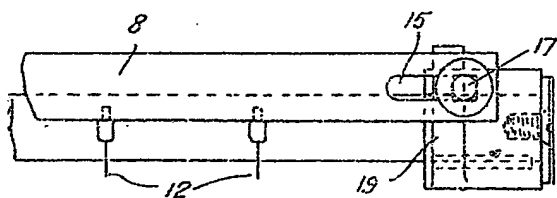
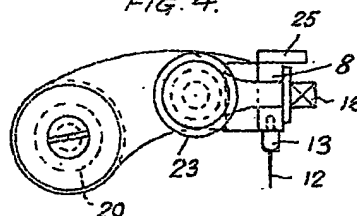


FIG. 4.



5.

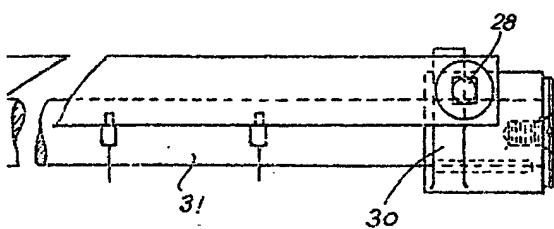
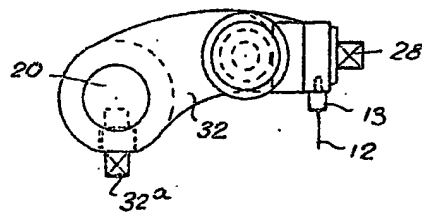


FIG. 6.



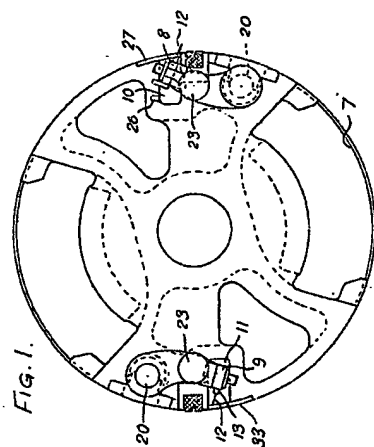


FIG. 2.

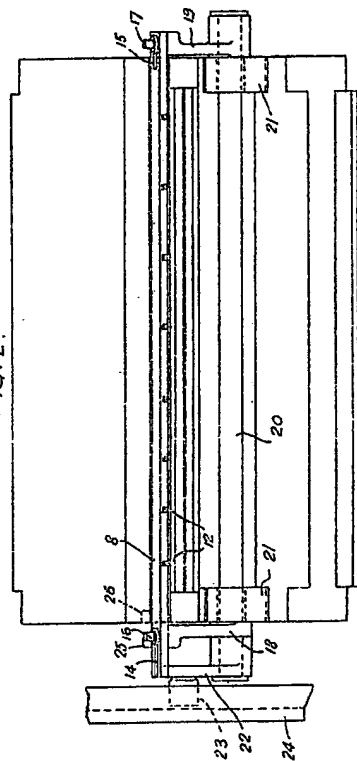


FIG. 3.

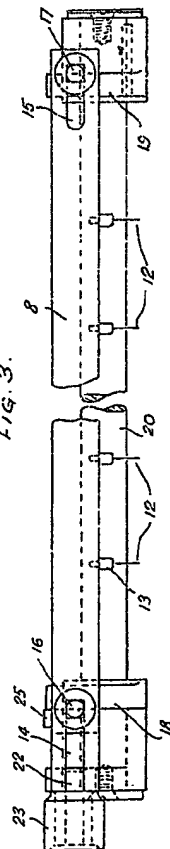


FIG. 4.

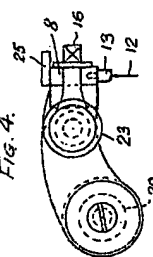


FIG. 5.

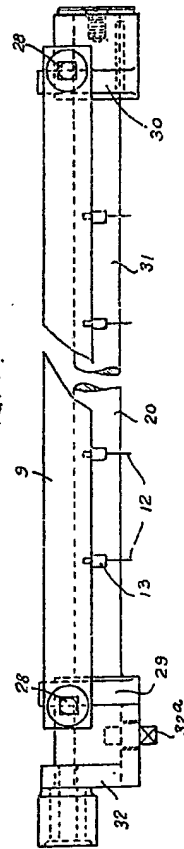
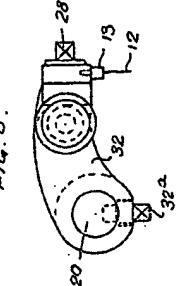


FIG. 6.



[This Drawing is a reproduction of the Original on a reduced scale]

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